

Application No.: 10/590,704  
Art Unit: 2123

Amendment under 37 CFR §1.111  
Attorney Docket No.: 062916

**AMENDMENTS TO THE DRAWINGS**

The attached two sheets of drawings include changes to Figures 2 and 50. These two sheets, which include Figures 2 and 50, respectively, replace the original two sheets which included Figures 2 and 50. In Figures 2 and 50 the words “THEE DIMENSIONAL” have been deleted and --THREE DIMENSIONAL—inserted in their place.

Attachment: Replacement Drawing Sheets (2)

### **REMARKS**

Please reconsider the application in view of the foregoing amendments and the following remarks.

### **Status of Claims**

Claims 1-10 are pending in the present application. Claims 11-34 are withdrawn from consideration. Claims 1-7, 9 and 10 are herein amended. Claim 8 is herein cancelled. No new matter has been entered.

### **Drawings**

The Office Action has objected to Figures 8 and 50 because of the term "THREE-DIMENSIONAL" is misspelled as "THEE-DIMENSIONAL. Applicant herein presents corrected Figures 8 and 50 for consideration. Applicant appreciates the Examiner's careful review of this application. Replacement drawing sheets are attached to this paper.

### **Specification**

The Office Action has objected to the abstract of the disclosure because it is not limited to a single paragraph. Applicant herein amends Abstract to overcome the objection. As such, Applicants request that the objection be withdrawn.

**Claim Objections**

On page 4 and 5, items 6-12, the Office Action objects to claim 1-10. Applicant has amended claims 1-7, 9 and 10. Claim 8 has been cancelled. As such, Applicant respectfully submits that the amended claims overcome the claim objections set forth in the Office Action. Accordingly, Applicant requests that the objection be withdrawn.

**Claim Rejections - 35 U.S.C. §112**

Claims 1-8 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant has amended claim 1 to positively recite method steps. As such, Applicants submit that the amended claim 1 overcomes the rejection regarding claims 1-8. According, Applicants request that the rejection be withdrawn.

**Claim Rejections - 35 U.S.C. §101**

Claims 1-7 have been rejected under 35 U.S.C. 101 because they are directed to non-statutory subject matter. Specifically, it was found that these claims do not comply with 35 U.S.C. 101 because they are not tied to another statutory class (such as a particular apparatus) or transform underlying subject matter (such as an article or materials) to a different state or thing. Additionally, it is found that the body of the claim must positively recite the particular apparatus performing the method steps. Applicant has amended claims 1-7. As such, Applicant submits

that the amended claims overcome the rejection. Accordingly, Applicant requests that the objection be withdrawn.

Claim 8 has been cancelled. Therefore, the rejection of claim 8 no longer applies.

**Claim Rejections-35 U.S.C. §103**

As to the merits of this case, the Examiner sets forth the following rejection:

Claims 1-10 were rejected under 35 U.S.C. 103(a) as being unpatentable over **Haupt** (US 6,832,128) in view **Guiqing et al.**, ("3D Discrete Clothoid Splines", 2001 IEEE) in view of **Drennen et al.** (US 2002/0189385).

This rejection is respectfully traversed.

Drennen does not teach or suggest that a pitch angle and yaw angle in a tangential direction of the three-dimensional clothoid curve is given by a quadratic expression comprising of a curve length or a curve length variable.

Concerning this point, the examiner asserts that "if a three-dimensional clothoid curve is used to design the ball screw apparatus disclosed by Drennen, it would have a pitch angle and yaw angle in a tangential direction of the three-dimensional clothoid curve and would be based on a curve length or a curve length variable due to the intrinsic characteristics of the ball screw apparatus disclosed by Drennen."

A curve disclosed by the Drennen would have a pitch angle and yaw angle in a tangential direction and have a curve length or a curve length variable as long as the curve disclosed by the Drennen is a three-dimensional curve.

However, it is not taught or suggested by Drennen that the pitch angle and the yaw angle in a tangential direction is linked with the curve length or the curve length variable and is defined by the quadratic expression comprising of a curve length or a curve length variable.

The three-dimensional clothoid curve defined by this formula is conceived by the inventor for the first time. By way of expressing the feature of the three-dimensional clothoid curve in the form above assures that the tangential direction, a normal direction and a curvature are continuous in respect of the curve length or the curve length variable. Because, the normal direction is provided by differentiating the quadric expression in a first order, and the curvature is provided by differentiating the quadric expression in a second order, it is therefore possible to provide smooth curves with high-quality.

Because the cited references do not teach or suggest all of the claimed elements and limitations in amended claim 1-7, 9 and 10, Applicant respectfully submits that a person of ordinary skill in the art would not make the combination suggested by the examiner as obvious and the resulting combination would not yield the claimed invention. Accordingly, it is respectfully requested that the rejection under 35 U.S.C. 103 be withdrawn.

Application No.: 10/590,704  
Art Unit: 2123

Amendment under 37 CFR §1.111  
Attorney Docket No.: 062916

**Conclusion**

The Claims have been shown to be allowable over the prior art. Applicants believe that this paper is responsive to each and every ground of rejection cited in the Office Action dated December 9, 2008, and respectfully request favorable action in this application. The Examiner is invited to telephone the undersigned, applicants' attorney of record, to facilitate advancement of the present application.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

**WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP**



Robert Y. Raheja  
Attorney for Applicants  
Registration No. 59,274  
Telephone: (202) 822-1100  
Facsimile: (202) 822-1111

RYR/bam